RTMOTION **MK3.x**

Lens Control System

User Guide

REVISION: 2013-09-05
www.rtmotion.com/support

1 MK3.x Lens Control System

Table of Contents

1. MK3.x Lens Control System....2
2. Quick Start Guide....3
Initial Setup....3
Camera Run/Stop....3
3. System Overview....4
Introduction....4
Theory of Operation....4
Wireless....5
Accessories....5
Usage Chart....6
4. Components....7
MK3.x Controller....8
MK3.x Receiver....13
MK3.x Motor....15
Slave Controller – Thumbwheel MK1....17
5. Aux Ports....18
Available Modes of Operation....18
Setting the AUX PORT's Mode....19
6. Updating Firmwares....20
7. Menu Tree....26
8. Technical Reference....29
Compatibility Guidance....29
Pin-Outs....30
Sizes & Weights....33
9. Troubleshooting....35
10. Additional Information....37
Usage & Environment....37
12/24 Month WARRANTY....37
Contact Information....37

2 Quick Start Guide

Initial Setup

1 Plug 12V into the RECEIVER's "PWR" port.

Max voltage is 17V. If the voltage is over ~17.5V or polarity is reversed,

The Receiver will block the dangerous voltage and not start.

2 Affix one or more MOTORS to the rods/ lens.

Note that the motors are labelled as FOCUS, IRIS, etc.

3 Plug the motors into the RECEIVER unit.

The motor port that the motors attach to isn't important. The motors will begin calibrating.

4 Put a Canon LP-E6 battery in the Hand Unit and hold down the PWR button.

Camera Run/Stop

1 Connect the appropriate Run/Stop cable from the CAM port on the Receiver to your Camera.

2 Enter the Controller's MENU, Select CAMERA, then select which camera you have connected.

3 You can now Run/Stop the camera with the REC button.

3 System Overview

Introduction

The RTMOTION MK3 Lens Control system is optimised for high-end Wireless and Wired remote control of Cinema and Still camera lenses.

The range is specifically designed to enable a low-cost entry point (single motor), with a broad expansion capability.

A large number of accessories are in development to further expand on the range's capability (gimbal controllers, underwater controllers, etc.), and we always welcome feedback on how we can better serve your needs.

Theory of Operation

Smart Motors

The MK3 MOTOR units are intelligent smart motors, with built-in electronics which handle all seeking and calibration behaviour. When powered up, the motor will find the lens end-stops and learn the characteristics of the attached lens. It does all of this without any help from the Receiver or Controller.

Each motor remembers its CLASS (focus, iris, zoom), and its RESPONSE (normal, fast, slow). You can therefore plug any motor into any Receiver port.

To re-configure a motor, you need to use the CONTROLLER menus.

Since the motors have their own intelligence, they need only a small 4-pin lemo cable for operation.

Receiver Unit

Offloading some electronics into the smart motors has enabled us to dramatically shrink the Receiver in size. It handles only NETWORKING and CAMERA INTERFACE operations. This has enabled a system with low cost, high flexibility and very small size.

Controller (Hand Unit)

The Controller is the main brain of the unit. Via its OLED screen it also handles the remote-configuration of the Receiver and Motor.

Wireless

RF3 Generation

From MK3.1 onwards, devices include our latest RF3-Generation wireless modules. We strive to stay at the forefront of performance, and therefore we have jumped at the opportunity to offer what we believe is the longest range, most interference-immune wireless solution on the market. FCC and CE certification is of course retained, and we are now right up to the legal limit.

Accessories

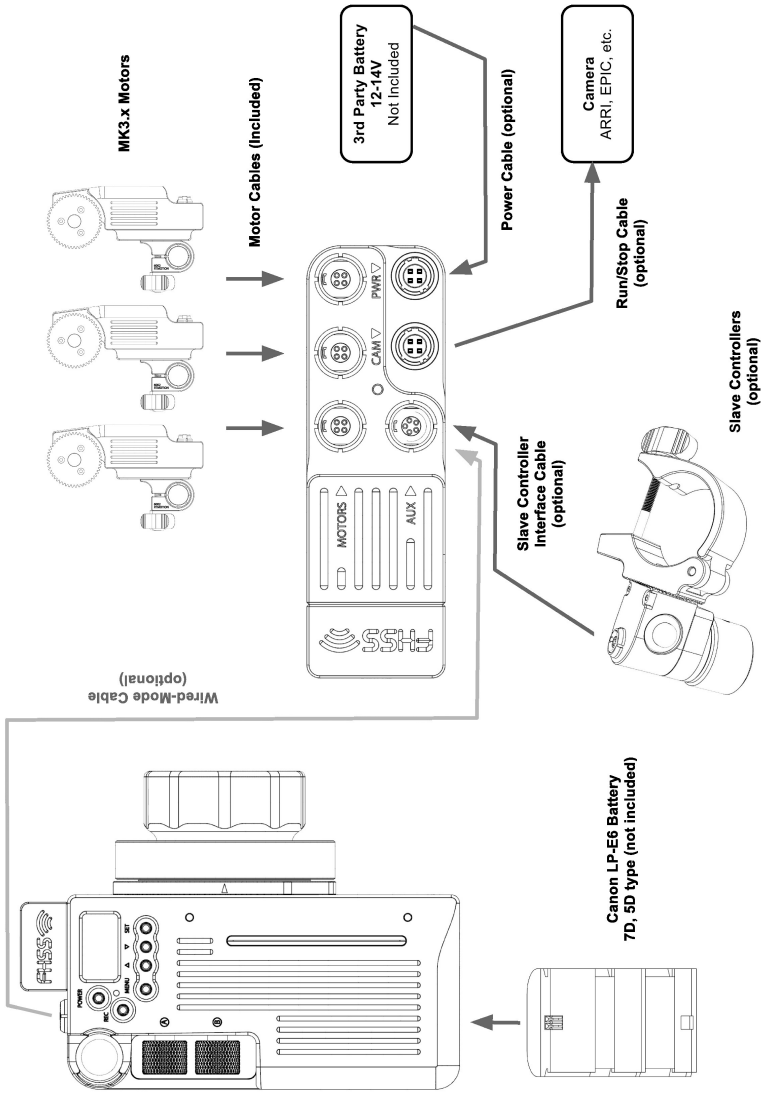
Slave Controllers

Slave Controllers are simple (affordable) devices—such as joysticks, thumbwheels, record buttons—which rely on external electronics to function. To use a Slave Controller, you need to attach it to an RTMOTION device with an AUX socket. For example, RECEIVER MK3.1.

Smart Controllers

Smart Controllers contain electronics, and therefore do not require a Controller or Receiver. You need only POWER and a MOTOR. Our range of smart controllers are estimated for shipping in late 2013.

Usage Chart


MK3.x Motors
Motor Cables (Included)
3rd Party Battery
12-14V
Not Included
Power Cable (optional)
Camera
ARRI, EPIC, etc.
Run/Stop Cable
(optional)
Slave Controllers
(optional)
Slave Controller
Interface Cable
(optional)
Wired-Mode Cable
(optional)
Canon LP-E6 Battery
7D, 5D type (not included)
PWR
CAM
MOTORS
AUX

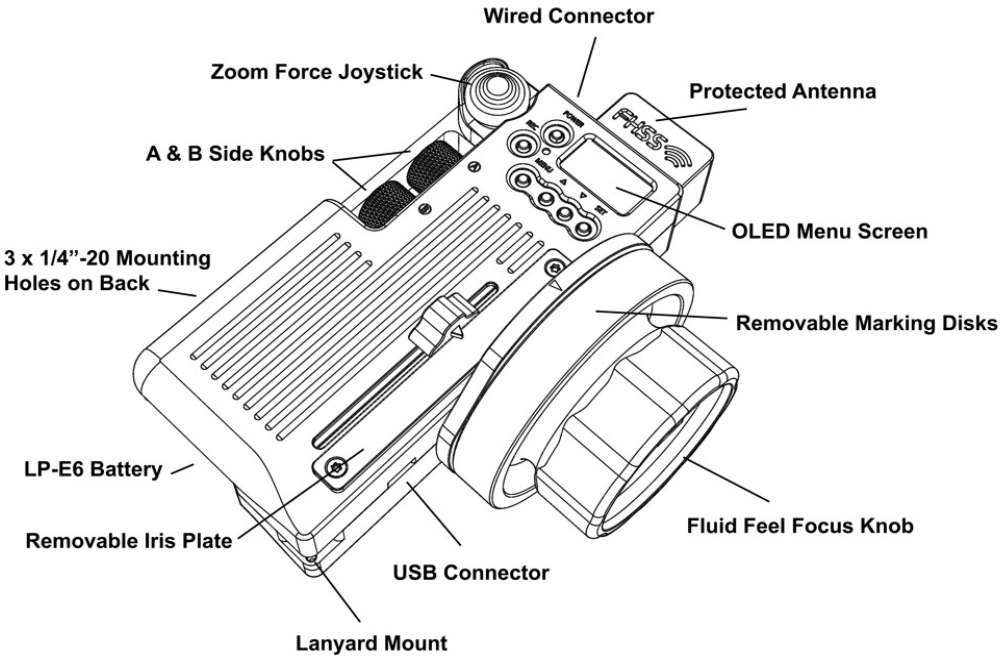
4 Components

Table of Contents

MK3.x Controller 8
MK3.x Receiver 13
MK3.x Motor 15
Slave Controller – Thumbwheel MK1 17

MK3.x Controller

The MK3.x CONTROLLER gives from 3 to 6 axis control.



Note: Picture shows MK31/Z variant with optional Force Zoom Joystick.

Configurations

Any **INPUT** (Large knob, Side Knob A, etc.) can be assigned to any **LENS AXIS**.

For example, an MK3/B "Basic" controller can be configured so that the MAIN KNOB controls Focus, SIDE KNOB A controls Iris, and SIDE KNOB B controls Convergence.

All variants are capable of simultaneously controlling at least 3 axis, so are effectively "FIZ" and "3D" capable.

There are however significant ergonomic advantages to industry standard controls, so for fine control it is recommended that the Force Joystick is used for Zoom, and the Slider is used for IRIS.

MK3 Variants

MK3 versions have RF2 wireless modules. See section page 29.

1 MK3/B, "Basic". 3 Axis Control

Large Focus Knob, 2x Side Knobs (A and B).

2 MK3/S, "Stereo". 4 AXIS CONTROL

Large Focus Knob, Slider, 2x Side Knobs (A and B).

3 MK3/Z, "FIZ". 6 AXIS CONTROL

Large Focus Knob, Slider, Force Joystick (X/Y), 2x Side Knobs (A and B).

MK3.1 Variants

MK3.1 versions have RF3 wireless modules. See section page 29.

1 MK31/S, "Stereo". 4 AXIS CONTROL

Large Focus Knob, Slider, 2x Side Knobs (A and B).

2 MK31/Z, "FIZ". 6 AXIS CONTROL

Large Focus Knob, Slider, Force Joystick (X/Y), 2x Side Knobs (A and B).

Operation

1 Power On

Hold down the POWER button for 2 seconds to turn the unit ON / OFF.

2 Camera Run/ Stop

Press the REC button to start recording. Press REC again to stop recording.

Note: you must use the correct Run/Stop cable for your camera and select the correct option in MENU / CAMERA.

3 Status LED

OFF – Unit is OFF	**ORANGE** – No Connection	**GREEN** – Unit is Connected
BLUE – Wired Mode	**RED** – Camera Running	**PURPLE** – Please Wait

4 PC Mode / Bootloader

Turn off the Controller. Hold down the SET button. Keep SET held, and also hold down the POWER button. The Status LED will go Orange, and the screen display: "PC MODE". You can now connect the controller to a PC and it will show as a USB device.

5 Battery / Power

The Controller takes a CANON TYPE LP-E6 BATTERY, as used in the Canon 5D, 7D, etc.

It can also run from the MICRO USB connector (5V). Please note, minimum is approx 4.65V- some laptops, etc. don't provide quite enough voltage.

6 Factory Reset

Enter the MENU / ADVANCED / FAC RESET.

Short-cut: You can also hold POWER and press MENU.

CONTROLLER MENU

Press the MENU button to enter the menu.

You can then navigate with the UP, DOWN and SET buttons.

To go back one step, press MENU.

To abort and pull out of the menu, press POWER.

For a full breakdown of menu functions, go to page 27.

Default Configurations

		MK3/B "BASIC"	MK3/S "STEREO"	MK3/Z "FIZ"
Large Knob	→	**FOCUS**	**FOCUS**	**FOCUS**
Slider	→	(not present)	**IRIS**	**IRIS**
Force Joystick Y	→	(not present)	(not present)	**ZOOM**
Force Joystick X	→	(not present)	(not present)	(Inactive)
Side Knob A	→	**IRIS**	**ZOOM**	**ZOOM SPEED**
Side Knob B	→	**ZOOM**	**INTER-OCULAR**	**INTER-OCULAR**

Low Battery Indication

The Controller will give a warning and automatically shut down when the battery voltage falls to approx 6.1V. This is to protect the Battery from being over-drained and reducing its life.

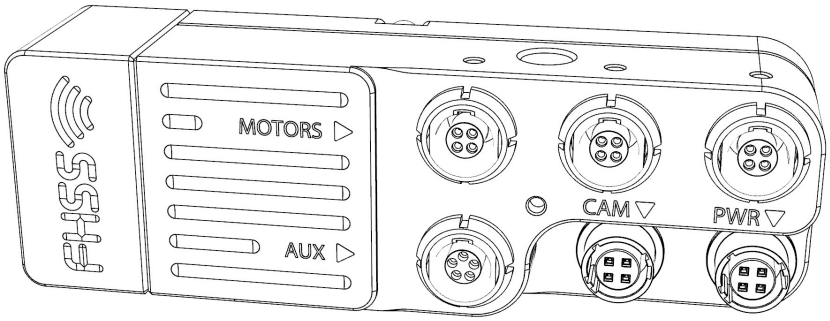
If your battery is fully drained and you wish to continue on USB power, you must remove the LP-E6 battery from the unit.

Power Requirements

Canon LP-E6 battery:	6.2V to 8.4V.
USB Socket:	Approx 4.75V to 9V max.

MK3.x Receiver

The MK3.1 Receiver is a unique, ultra-compact design. From version MK3.1, the antenna is integral and the length reduced even further.



Note: Picture shows MK3.1 version.

Variants

MK3 versions have RF2 wireless modules, and no AUX port.

MK3.1 versions have RF3 wireless modules. See section page 29 for more info.

Supported Motors

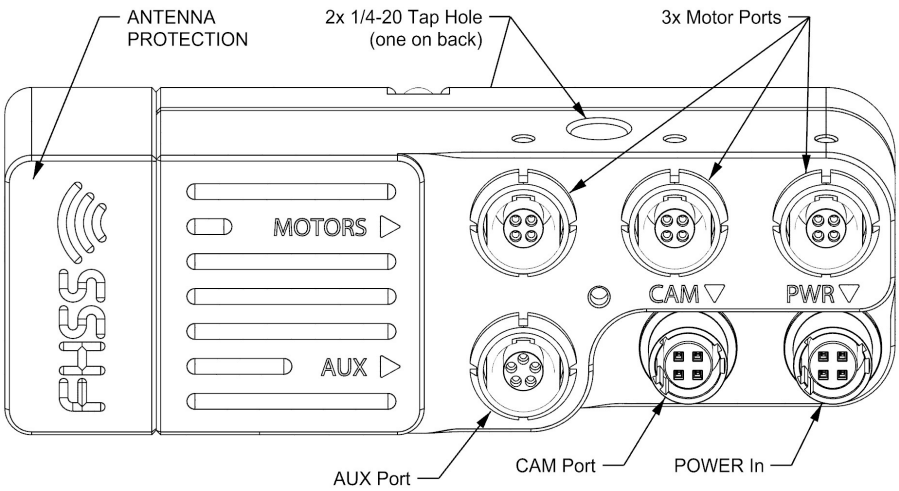
3x RT Motion motors are supported.

The Receiver does not natively support motors from other manufacturers. It is planned to release a "dongle" adapter to support 3rd party motors (Heden, Preston, etc.) soon.

Camera Support

Attach the corresponding cable between the CAM port and your camera. There are cables available for all major cameras (EPIC, ARRI, etc.). You must also select your camera-type from the Controller Menu, see page 26.

Operation



Connection

MOTORS	Lemo 0B 4-pin	Any motor can connect to any port.
PWR	Hirose HR10 4-pin	Power Input, 1=GND, 4= Voltage.
CAM	Hirose HR10 4-pin	Trigger (Output) for CAMERA.
AUX	Lemo 0B 5-pin	Analogue controllers, Wired Mode, etc.
USB	Micro USB	For connection to a PC.

Status Light

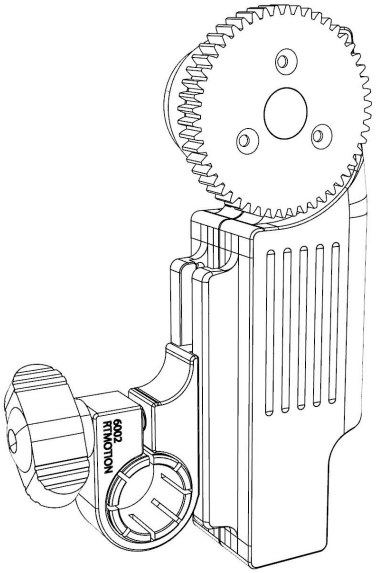
SOLID GREEN – CONNECTED	**PURPLE** – Please Wait
ORANGE – No Connection (or PC Mode)	**RED** (solid) – Cam running
BLUE – Wired Mode	**RED** (pulse) – Cam trig

Power Requirements

5 – 14V DC (17V absolute max - e.g. 13.8V battery fresh off a charger). The Receiver will block any voltage over ~17.5V, or any reverse voltage.

MK3.x Motor

A powerful and quiet lens motor with smooth performance. The brush-less vector-drive gives unparalleled smoothness during high-torque / slow-speed moves.



Warnings

The motor is a powerful device which is capable of causing injury or damage.

- Never touch the drive gear when the device is powered on.
- The motor is not to be used on extremely stiff or damaged lenses.
- The motor requires no user maintenance. Please note that opening the motor can affect its internal calibration and voids the warranty.

Variants – MK3 and MK3.1

The MK3.1 revision features a dual-sided hub (allowing the gear to be fitted to either side, or both sides simultaneously). The gear train has also been further improved, with improvements to efficiency and a further reduction in operating noise level.

MK3 and MK3.1 models use identical firmwares and have identical compatibility.

Attaching to a rig

Affix the motor to the rods, but don't yet mesh the drive gear to the lens gear. Rotate the focus ring so that it is not too close to either end stop. Now mesh the gears, and plug the Digital Motor into the Receiver. The Digital Motor will begin its Auto-Calibration Routine.

Accuracy & Electronic Backlash Comp

The MK3 motor features a high-precision encoder that will never lose steps. If you see evidence of backlash affecting accuracy, please make sure that your mount, rails and camera are extremely rigid, as mounting flex is the main cause of inaccuracy. Unique electronic backlash compensation is calibrated at the factory and will be tweak-able via future firmware update.

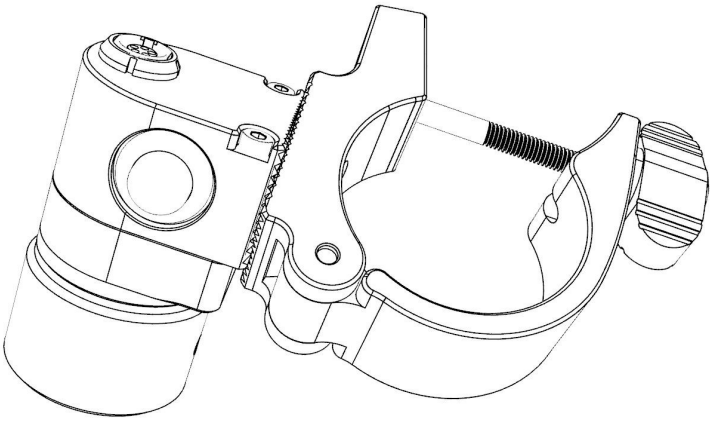
Focus/ Iris/ Zoom Assignment

The Digital Motor is internally assigned a "Motor Class", which is saved to non-volatile memory. The motor will identify itself to the CONTROLLER via its SERIAL NUMBER (lasered onto the motor back, example: 0500). To change the class of a Digital Motor, or other performance parameters (performance mode, direction of rotation, etc.) please refer to the manual for the Controller.

Specifications

Max Allowable Torque	2.2Nm
Standard Gear	0.8 mod, 50 Teeth
Nominal Current	Approx 0.6A loaded
Power Requirements	5-17V

Slave Controller – Thumbwheel MK1



Features

- Strong, lightweight Alu construction. Knurled thumb/finger wheel.
- Bracket sized for common professional steadicam gimbals.
- Hard stops. Lens maps to approx 200º rotation
- Record trigger button.

Usage & Configuration

Wire into an AUX port via a "Slave Controller" interface cable. The AUX port must be configured to accept a "Knob/ Potentiometer" input. See page 19 for instructions on how to configure the AUX port correctly.

5 Aux Ports

The AUX port is a multi-use port, supporting the use of Analogue controllers (Knob/pot, Rocker, Force Joystick), Wired-Mode operation (connect the Controller to the Receiver directly, to bypass the wireless), as well as TTL-level serial communication.

The AUX PORT will feature on an increasing number of upcoming products, and we will be releasing additional accessories to attach to AUX ports soon.

Available Modes of Operation

The following functions are supported by the AUX port. The AUX port must be configured in the appropriate mode (see page 27) – it does NOT automatically detect which of the following modes you wish to enable.

Slave Controllers (aka, Analogue Controllers)

Slave controllers (thumbwheel, rocker, etc.) directly connect to the AUX port, and can be configured to control any available axis (Focus, Iris, etc.). Run/Stop triggering is also supported, provided that you have an appropriate cable connected to your camera from a CAM port.

Wired Mode (bypass Wireless)

Devices which have a 5-pin WIRED MODE socket (such as a Controller MK3.1) can connect to the AUX port via a suitable wired-mode cable. The Status LED on both devices will go BLUE to indicate that a connection has been made, and that Wireless transmission is disabled.

Cinetape, Fujinon Control, Cook I/ data, RS232

Support for these protocols is coming soon. It will require an RS232 dongle, between the AUX Port and the 3rd-party device.

Setting the AUX PORT's Mode

The AUX port must be in the correct mode. The setting is remembered after power-cycling.

To configure the AUX PORT, use the CONTROLLER. Enter the MENU, then select AUX.

AUX	Configure the auxiliary port on the RECEIVER. Note, if your Receiver does not have an 5 pin AUX port, you will not have this menu.
MODE	What function to assign to the AUX PORT?
OFF	Disable the AUX port
WIRED	Configure AUX port for WIRED MODE (i.e. wire from Controller -> Receiver to bypass radio)
KNOB	You have a KNOB or THUMBWHEEL attached to the AUX PORT.
ROCKER	You have a ROCKER attached to the AUX PORT.
FORCE	You have a FORCE SENSOR attached to the AUX PORT.
AXIS	Which axis to control with the attached AUX input device? N.B. This does not apply if you are in WIRED MODE.
FOCUS	
IRIS	
(etc.)	
MODE B	As “Mode” above, but for input axis B (for use with splitter)
AXIS B	As “Axis” above, but for input axis B (for use with splitter)

6 Updating Firmwares

Introduction

This guide will take you step by step through the process of updating the firmware on the Controller, Receiver and Motors. Updating the device firmware is a normal process to take advantage of new features, bug fixes, and general usability improvements based on feedback.

Cautions

Although the firmware updating process usually goes smoothly, very occasionally users may need additional support. For that reason, we do not recommend performing an update immediately before a shoot, in case of any problems. See page 24 for firmware update troubleshooting.

Requirements

Currently, you require a PC running Windows XP or newer. A Mac OSX version of the software is imminent.

Download the Latest Firmwares

Visit: **www.rtmotion.com/page/support**

Download and install the latest version for your platform. The package includes the Firmware Updater application itself, plus the latest Device Firmwares.

Follow @rtmotion on Twitter to be alerted to new features and important updates.

Updating The Controller Firmware

1. Run the Program.
2. Make sure the controller is turned off.
3. Connect the USB cable from the Controller to your computer.
4. Hold down the SET and POWER buttons simultaneously on the controller for about 2 seconds. The screen will display: PC MODE.
5. The program will now detect and connect to the Controller. You should see, “Connected to Device” in the program.
6. In the “Firmware” section, use the drop down menu to select a firmware version that matches your controller type:-
    1. Select Controller_MK3-B... for the Basic Controller.
    2. Select Controller_MK3-S... for the Slider Controller.
    3. Select Controller_MK3-Z... for the Force-Zoom Controller.
7. Click the “Update Device” button.

Note: The first time you connect your device, your operating system may install HID “Human interface device” drivers and require you to restart your computer. This is normal.

Updating The Receiver

1. Run the Program.
2. Make sure the receiver is not powered and that no motors are attached.
3. Connect the USB cable from the Receiver to your computer. The Receiver should power up.
4. The program will now detect and connect to the Receiver. You should see, “Connected to Device” in the program.
5. In the “Which Device to Update” section, select Receiver from the drop down menu.
6. In the “Firmware” section there should only be one firmware to select from the drop down.
7. Click the “Update Device” button.

Note: If you connect the Receiver to a computer without having the Firmware Updater Application already running, the Receiver will boot into “normal” operation and not be visible as a USB device. Always run the Firmware Updater application BEFORE attaching the Receiver to the computer.

Note: The first time you connect your device, your operating system may install HID “Human interface device” drivers and require you to restart your computer. This is normal.

Updating a Motor

1. Run the Program.
2. Make sure the Receiver is not powered and that no motors are attached.
3. Connect the USB cable from the Receiver to your computer. The Receiver should power up.
4. The program will now detect and connect to the Receiver. You should see, “Connected to Device” in the program.
5. Attach 12V power to the Receiver.
6. In the “Which Device to Update” section, select Motor from the drop down menu.
7. In the “Firmware” section there should only be one firmware to select from the drop down.
8. Click the “Update Device” button.
9. Attach ONE motor to the Receiver. The update process should begin.
10. When the motor begins moving, detach it from the Receiver. The process is complete.
11. If you need to update another motor, go to step 8.

Note: You can only update one motor at a time. Do not attach more than one motor or the update will fail.

Firmware Updating Troubleshooting

I get an "This application has failed to start because..." error.
You may need to install the Microsoft Visual C++ 2010 Redistributable Package. The installer should install this if it's not installed but they can also be manually installed from the programs /runtimes/ folder or downloaded from the microsoft site.

My PC is not detecting any of the devices.
Make sure you are not using a very long USB extension cable over 2 metres as that can cause connection issues.
Try restarting your PC and connect to a different USB port.
Check the micro USB cable is working ok.
Try on a different PC.

My PC is detecting the Receiver but not the Controller.
Make sure the update program has been started and that the controller is set to "PC MODE", To enter "PC MODE" Hold down the SET and POWER buttons.

My PC is detecting the Controller but not the Receiver.
Make sure the update program has been started and is running and that the receiver is not powered on before connecting to the PC.

I'm still having problems.

Please contact us at **support@rtmotion.zendesk.com**

To help us diagnose the problem please supply as much detailed information as you can.

7 Menu Tree

RECALIB	This is a short-cut to the MOTORS > RECALIB menu (below).
CAMERA	Select which CAMERA is attached to the RECEIVER.
ALEXA	ARRI Alexa (RS socket).
EPIC	RED EPIC (Sync socket).
RED ONE	RED ONE (Aux socket).
PH FLEX	Phantom Flex.
PH FLEX BS	Phantom Flex, Burst Mode.
HOLD LOW	For cameras which record while trigger is "held low".
MOTORS	Configure ATTACHED MOTORS.
RECALIB	RECALIBRATE one or more MOTORS.
RECAL ALL	Recalibrate all attached motors.
BY CLASS	Recalibrate motor by CLASS (e.g. Focus, Iris, Zoom).
FOCUS	
IRIS	
(etc.)	
MANUAL CAL	Manually calibrate end stops for a motor/lens.
RESPONSE	Adjust MOTOR RESPONSE. This setting is stored inside the motor.
NORMAL	Slightly smoothed for elegant moves.
SLOW	Very smoothed, useful for Iris or Zoom.
FAST	Very sharp response.
SET CLASS	Reassign a MOTOR to a particular class, e.g. Focus, Iris... This setting is stored inside the motor.
FOCUS	
IRIS	
(etc.)	
SET SERIAL	Change the internal serial number of a motor. This setting is stored.

	inside the motor.
SCREEN	Change OLED settings
HIGH	Full brightness for daytime. Status LED also bright.
LOW	Low brightness for night/indoor. Status LED dim.
OFF	OLED disabled (menu is still active). Status LED dim.
FLIP KNOB	Short cut which flips (reverses) the MAIN KNOB rotation.
WIRELESS	Settings for CONTROLLER MK3 generation (RF2).
CHANNEL	#1 - 13
WIRELESS	Settings for CONTROLLER MK3.1 generation (RF3).
RANGE	Select Controller transmission power.
USA MAX	Maximum Range legal in USA.
EU MAX	Maximum Range legal in EU and most of the world.
MED	Medium Range (best balance of range and battery life).
LOW	Required when very close to camera.
RESET	Force the wireless module to reboot. Debug feature, to be removed.
INPUTS	Configure the physical knobs/ slider on the controller.
AXIS	Which INPUT (Knob, Slider) should control which AXIS (Focus, Iris) ?
FOCUS → KNB	The FOCUS axis is controlled by KNB, i.e. main knob.
IRIS -> SLI	The IRIS axis is controlled by SLI, i.e. the slider.
etc.	
FLIP	Flip the direction of INPUTS. i.e. make the lens rotate in REVERSE.
KNOB = Y	The main knob is set to FLIP mode (reverse).
SLIDER = N	The slider is not set to flip.
etc.	
FILTER	This menu is currently inactive.
RECAL KNOB	Reconfigure the physical stops for the MAIN KNOB. If you are unable to reach the end of the lens travel, run this function.
AUX	Configure the auxiliary port on the RECEIVER. Note, if your Receiver

	does not have an 5 pin AUX port, you will not have this menu.
MODE	What function to assign to the AUX PORT?
OFF	Disable the AUX port.
WIRED	Configure AUX port for WIRED MODE (i.e. wire from Controller -> Receiver to bypass radio).
KNOB	You have a KNOB or THUMBWHEEL attached to the AUX PORT.
ROCKER	You have a ROCKER attached to the AUX PORT.
FORCE	You have a FORCE SENSOR attached to the AUX PORT.
AXIS	Which axis to control with the attached AUX input device? N.B. This does not apply if you are in WIRED MODE.
FOCUS	
IRIS	
(etc.)	
MODE B	As "Mode" above, but for input axis B (for use with splitter).
AXIS B	As "Axis" above, but for input axis B (for use with splitter).
BUTTONS	
BT 1	Assign a function to the physical UP button.
BT 2	Assign a function to the physical DOWN button.
BT 3	Assign a function to the physical SET button.
BT 4	Assign a function to the physical POWER+UP button combination.
BT 5	Assign a function to the physical POWER+DOWN button combination.
BT 6	Assign a function to the physical POWER+SET button combination.
ADVANCED	*Advanced functions for debugging and technician use only.*
SERIAL	*Change the Serial # of the handset (not recommended).*
FAC RESET	*Take the CONTROLLER back to factory default settings. This DOES NOT roll back the firmware version. It also does not change the settings stored inside the motors (class, response, etc.)*
DEBUGGING	*Raw read-outs to use for diagnosing issues.*
RADIO	*Enable/Disable the radio. (Radio is automatically disabled when wired*

mode is used).

8 Technical Reference

Compatibility Guidance

Motors

All MK3.x generation motors will work with any MK3.x generation Controller/Receiver sets.

Controller / Receiver Sets – RF2, RF3

Controllers and Receivers must be of the same "RF" generation. You can see the RF2 or RF3 logo lasered onto the Controller and Receiver.

MK3.0 Controller/Receiver sets have RF2 generation wireless modules.

MK3.1 Controller/Receiver sets have RF3 generation wireless modules.

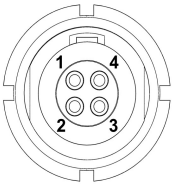
MK1 and MK2 generation systems.

These systems are now "end-of-life". We will strive to support them as long as possible, but we recommend that these systems are upgraded to the present generation to ensure the best support.

Pin-Outs

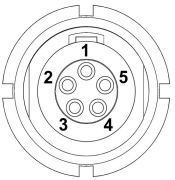
Controller MK3.0

WIRED-MODE SOCKET—Lemo 4-pin 0B	
1	GND
2	Signal A
3	Signal B
4	Early models, Not connected. Later models, Vhigh (Pwr in, 17V max)



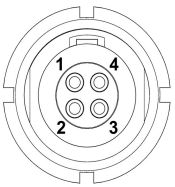
Controller MK3.1

WIRED-MODE SOCKET—Lemo 5-pin 0B	
1	GND
2	Signal A
3	Signal B
4	Power In, 5-17V DC
5	(nc)



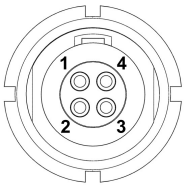
Motor MK3.0, MK3.1

MOTOR BUS SOCKET—Lemo 4-pin 0B	
1	GND
2	Signal A
3	Signal B
4	Power In, 5-17V DC

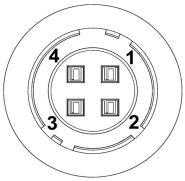


Receiver MK3.0

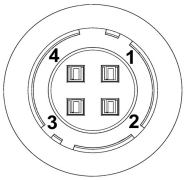
3x MOTOR SOCKETS—Lemo 4-pin 0B	
1	GND
2	Signal A
3	Signal B
4	Power **OUT**



PWR SOCKET—Hirose HR10 4-pin	
1	GND
2	(nc)
3	(nc)
4	Power **IN**, 5-14V DC (17V absolute max)

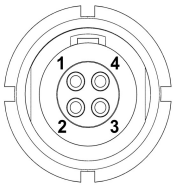


CAM SOCKET—Hirose HR10 4-pin	
1	GND
2	CAM TRIG (Output)
3	(currently not used)
4	(nc)

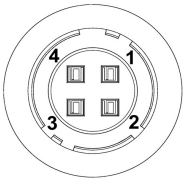


Receiver MK3.1

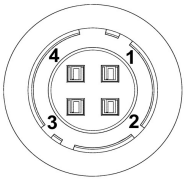
3x MOTOR SOCKETS—Lemo 4-pin 0B	
1	GND
2	Signal A
3	Signal B
4	Power **OUT**



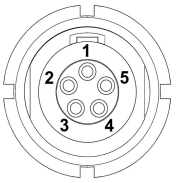
POWER SOCKET—Hirose HR10 4-pin	
1	GND
2	CAM TRIG (Output)
3	(currently not used)
4	Power **IN**, 5-14V DC (17V absolute max)



CAMERA SOCKET—Hirose HR10 4-pin	
1	GND
2	CAM TRIG (Output)
3	(currently not used)
4	(nc)



AUX SOCKET—Lemo 5-pin 0B	
1	GND
2	Analogue-in X (/Signal A)
3	Analogue-in Y (/Signal B)
4	3V3 out (0.2A max)
5	/CAM TRIG (Input, momentary GND to trigger)



Sizes & Weights

PART	APPROX SIZE	APPROX WEIGHT
Controller MK30	140x70x30mm (ex. knob). 170x115x85mm (inc. knob and stub antenna).	560g (ex battery and marking disc).
Controller MK31	140x70x31mm (ex. knob). 155x110x75mm (inc. knob and antenna).	576g (ex battery and marking disc).
Receiver MK30	85 x 30 x 21mm (ex. 5mm stub).	95g
Receiver MK31	100 x 30 x 23mm (inc. antenna cap).	118g
Motor MK30	106x43x24mm (ex. gear).	215g (with gear).
Motor MK31	115x40x24mm (ex. gear).	212g (with gear).
Slave Controller		138g
White Marking Disc		27g
Canon LP-E6 Battery		76g
Breakout Box	97x30x15mm	88g
Motor bracket		29g
Receiver bracket		30g
Gear	Ø42x5mm	8g

Motor Cable		34g
All Run/Stop Cables		30- 39g
Slave Cable		37g
XLR Power Cable		66g
Sony F55 Cable		41g
Red Epic +1 Cable		42g
MK-V Power Cable		51g
DC 2.1mm Power		19g
DTAP Cable		38g
Proline Power Cable		51g
1.2 Metre Wired		29g
2 Metre Wired		40g
5 Metre Wired		93g

Note: These weights are guidelines only- batch variation, incremental improvements and attempts to trim down weight could all result in small variations to numbers quoted.

Visit our website for a more up to date list.

9 Troubleshooting

Table of Contents

9. Troubleshooting.....35
1. The Wireless won't connect 35
2. My Motor calibrates but then won't move.....35
3. The Motor rotates in the wrong direction.....35
4. The Motor is in a strange mode, it is slow (or very fast).....36
5. The Zoom Motor calibrates but then doesn't respond.....36
6. When very close to camera, the wireless cuts out.....36

1 The Wireless won't connect

What is the STATUS LED colour?

GREEN

The wireless link is good, make sure your motor is assigned to the correct class (Focus, Iris), see below.

ORANGE

If your Receiver is MK3 version: Attach the CONTROLLER to the RECEIVER via a Wired/Motor cable. They will synch wireless channels. You can then disconnect the cable.

PURPLE

Please wait. If there is no change after 30 seconds, power-cycle the Controller (remove battery).

2 My Motor calibrates but then won't move

Perhaps the motor is not set to the correct CLASS. Go to MENU... MOTORS... CHANGE CLASS

3 The Motor rotates in the wrong direction

Rotation Flip is set by the CONTROLLER. Enter the Menu … INPUTS … FLIP … and then flip the Input Axis (such as Main Knob, or Slider) that you wish to reverse.

4 The Motor is in a strange mode, it is slow (or very fast)

Each motor is given a RESPONSE, and the motor remembers its response even through a power cycle. To change it, Enter the Menu … MOTORS … SET RESPONSE.

5 The Zoom Motor calibrates but then doesn't respond

ZOOM SPEED might be set to minimum. This is usually set by SIDE KNOB A.

6 When very close to camera, the wireless cuts out

This is normal. The MK3.1 has a very powerful wireless transmitter- when very close, it will overload the Receiver. Then the Controller's WIRELESS / POWER setting down to MED or LOW.

10 Additional Information

Usage & Environment

The system should not be opened, doing so can cause damage on closure, and voids the warranty. The MK3 system is not water proof- do not expose the system to any type of water, or condensation-prone situations.

12/24 Month WARRANTY

RT Motion Systems products are guaranteed for a period of 12 months with effect from the date of delivery (or date-of-purchase, if purchased from a 3rd party) and applies to defects arising from defective materials and or faulty workmanship that become evident during the guarantee period only and does not include consumable items. This guarantee is extended to 24 months if purchased direct from the manufacturer, or registered with the manufacturer within 3 months of purchase from a 3rd party. The manufacturer will repair or replace the product at their discretion subject to the following. That the product has been used in accordance with the guidelines as detailed in the product manual and that it has not been subjected to misuse, abuse or used for a purpose for which it was not intended. That is has not been tampered with or has been serviced by unauthorised persons. It shall be the customer's responsibility to return the product at their cost ensuring that the product is adequately packed to prevent transit damage. If the product was purchased from a 3rd party such as a distributor, proof of date-of-purchase must be included. The manufacturer shall not be liable for any consequential loss or damage arising from faults that occur either within, or outwith the guarantee period. This guarantee is in addition to and does not affect any rights which the consumer may have by virtue of UK or EU law.

Contact Information

RT Motion, 25 The Ridings, Surbiton, London, KT5 8HG, UK (admin office).
Tel: +44 2030 210 803. Email: support@rtmotion.zendesk.com

Note: Do not return any goods without contacting us for Return Instructions.